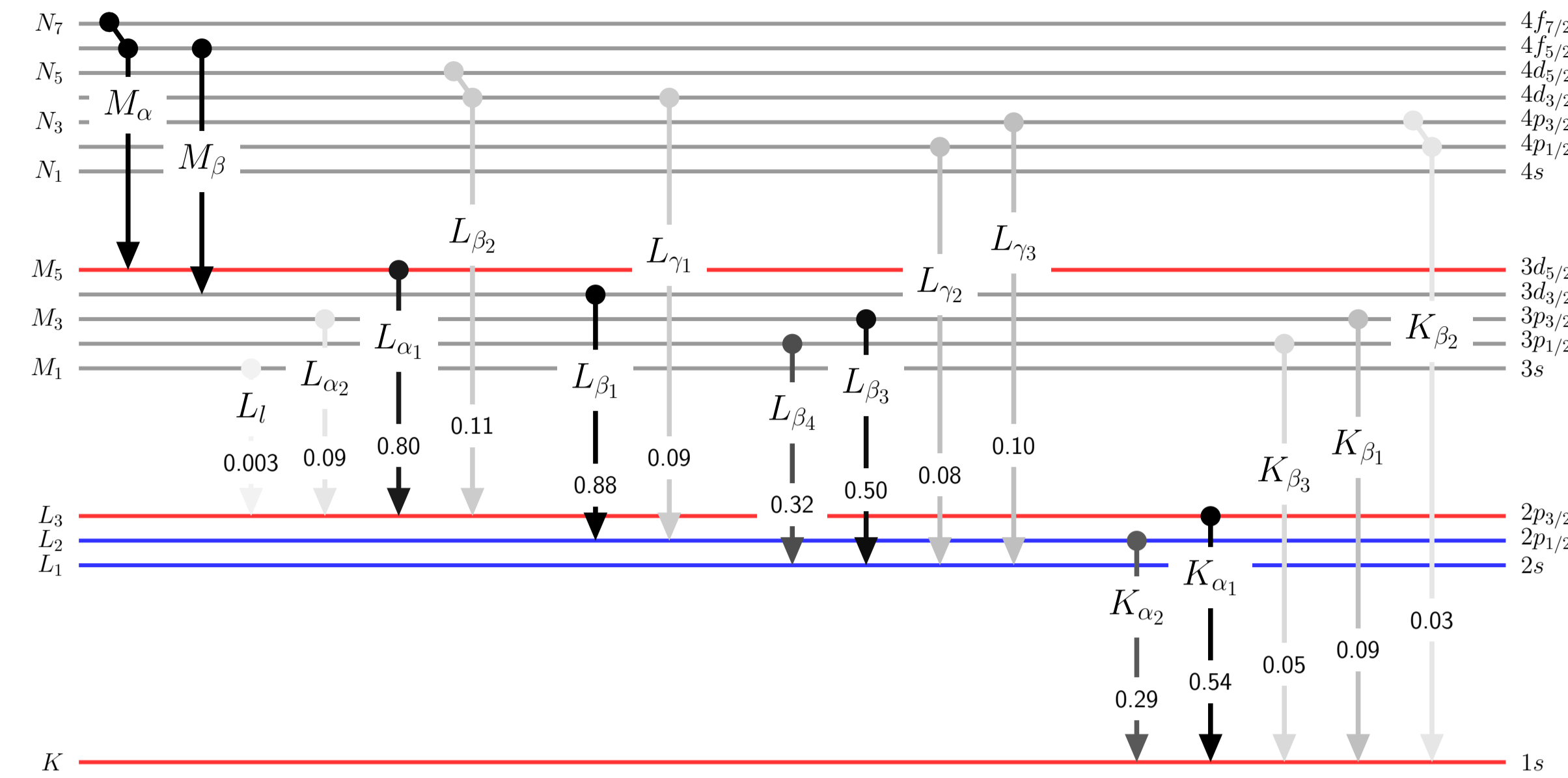


<b>H</b> hydrogen 1 1.0078	<b>He</b> helium 2 4.0026
<b>Li</b> lithium 3 6.94	<b>Be</b> beryllium 4 9.0122
<b>Na</b> sodium 11 22.9898	<b>Mg</b> magnesium 12 24.305
<b>K</b> potassium 19 39.0983	<b>Ca</b> calcium 20 40.078
<b>Rb</b> rubidium 37 85.4678	<b>Sr</b> strontium 38 87.62
<b>Cs</b> cesium 55 132.905	<b>Ba</b> barium 56 137.327
<b>Fr</b> francium 87 223.0	<b>Ra</b> radium 88 226.0

# X-ray Absorption and Emission Energies of the Elements



Atomic Data and Energies from  
W. T. Elam, B. D. Ravel and J. R. Sieber,  
*Radiation Physics and Chemistry* 63, pp 121-128 (2002)

Common oxidation states from wikipedia.org, after  
N. N. Greenwood and A. Earnshaw,  
*Chemistry of the Elements*, 2nd ed. (1997).

All energies in eV.  
Emission line strengths are approximate, and vary with element.

Symbol	Z
<b>K edge</b>	K <sub>α1</sub> K <sub>β1</sub>
<b>L<sub>1</sub> edge</b>	L <sub>β3</sub> L <sub>β1</sub> L <sub>γ1</sub>
<b>L<sub>2</sub> edge</b>	L <sub>β1</sub> L <sub>β2</sub> L <sub>β3</sub>
<b>L<sub>3</sub> edge</b>	L <sub>α1</sub> L <sub>α2</sub> L <sub>β1</sub> L <sub>β2</sub> L <sub>β3</sub>
<b>M<sub>5</sub> edge</b>	M <sub>α</sub> M <sub>β</sub>
<b>Mass</b>	oxidation states

<b>B</b> boron 5 10.81	<b>C</b> carbon 6 12.011	<b>N</b> nitrogen 7 14.007	<b>O</b> oxygen 8 15.999	<b>F</b> fluorine 9 18.9984	<b>Ne</b> neon 10 20.1797
<b>Al</b> aluminum 13 26.9815	<b>Si</b> silicon 14 28.085	<b>P</b> phosphorus 15 30.9738	<b>S</b> sulfur 16 32.06	<b>Cl</b> chlorine 17 35.453	<b>Ar</b> argon 18 39.948
<b>Ga</b> gallium 31 69.72	<b>Ge</b> germanium 32 72.63	<b>As</b> arsenic 33 74.9216	<b>Se</b> selenium 34 78.971	<b>Br</b> bromine 35 79.904	<b>Kr</b> krypton 36 83.798
<b>In</b> indium 49 114.818	<b>Sn</b> tin 50 118.71	<b>Sb</b> antimony 51 121.76	<b>Te</b> tellurium 52 127.6	<b>I</b> iodine 53 126.905	<b>Xe</b> xenon 54 131.293
<b>Tl</b> thallium 81 204.383	<b>Pb</b> lead 82 207.2	<b>Bi</b> bismuth 83 208.98	<b>Po</b> polonium 84 209.0	<b>At</b> astatine 85 210.0	<b>Rn</b> radon 86 222.0

<b>Ce</b> cerium 58 140.116	<b>Pr</b> praseodymium 59 140.908	<b>Nd</b> neodymium 60 144.242	<b>Pm</b> promethium 61 145.0	<b>Sm</b> samarium 62 150.36	<b>Eu</b> europium 63 151.96	<b>Gd</b> gadolinium 64 157.25	<b>Tb</b> terbium 65 158.925	<b>Dy</b> dysprosium 66 162.5	<b>Ho</b> holmium 67 164.93	<b>Er</b> erbium 68 167.259	<b>Tm</b> thulium 69 168.934	<b>Yb</b> ytterbium 70 173.045	<b>Lu</b> lutetium 71 174.967
<b>Th</b> thorium 90 232.038	<b>Pa</b> protactinium 91 231.036	<b>U</b> uranium 92 238.029	<b>Np</b> neptunium 93 237.048	<b>Pu</b> plutonium 94 239.052	<b>Am</b> americium 95 243.0	<b>Cm</b> curium 96 247.0	<b>Bk</b> berkelium 97 247.0	<b>Cf</b> californium 98 251.0	<b>Es</b> einsteinium 99 251.0	<b>Fm</b> fermium 100 251.0	<b>Md</b> mendelevium 101 251.0	<b>No</b> nobelium 102 251.0	<b>Lr</b> lawrencium 103 251.0



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